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AUTHOR	McGowan, Barbara; Liu, Phyllis Y. H.
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Barbara McGowan and Phyllis Y. H. Liu
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CREATIVITY AND MENTAL HEALTH OF SELF-RENEWING WOMEN

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Several factors have contributed to the changing pattern of women's lives in recent times. For one thing, a woman's life is longer. In 1900 her life expectancy was 48; now it is 75. She marries younger and usually has her family completed well before the age of thirty. By the time her youngest child is in school she still has 40 years of life ahead of her. Realization of this potentially useful, but relatively empty, life-span ahead causes great numbers of "mature" women to seek counseling. All of them hope to widen the scope of their lives as they find the freedom to do so. Many of them are eager to discover the level of their actual abilities.

Striking consistencies have become apparent in studying these women who search for new directions in their middle years. They seem to represent many of the qualities and much of the spirit of Maslow's self-actualization and Gardner's self-renewal. Maslow (1959) has said that "self-actualization," as opposed to "talent," springs from personality, that it shows itself as an effect of positive mental health. Self-actualizing people are less fearful of others, more self-accepting.

According to Maslow, the quality appears in behavior as creative flexibility and free energy, the seeming ability "to accomplish the ordinary affairs of life in a creative way."

It has become possible in recent years to measure creativity objectively through Cattell's Sixteen Personality Factors Questionnaire. Cattell and Drevdahl (1955), Drevdahl (1956), Ohmacht (1967) and others have done noteworthy work in identifying the factors which regularly describe the personality characteristics of people who have demonstrated their creativity, whether it be in the arts or the sciences. In addition, Cattell and Eber (1957) have developed a formula for the weighting of critical primary factors which may be applied to any 16 PF profile to produce a composite factor score from which to estimate general creativity.

Personality pathology is rarely present in active, productive, creative persons, as has been demonstrated in the work of Maslow (1959), Guilford (1962), Alamshah (1967), and Barron (1963), among others. Fortunately, the 16 PF profile also produces a composite mental health or "freedom from pathology" score, again by application of a specification formula.

Few investigators to date have explored the personality dimensions of women who, in middle life, have sought to enrich their lives by developing serious commitments outside the home. In this study we have determined the personality factors of such a group as measured by the

16 PF test. The scores for these women, whom we have called "self-renewing" women, have been compared with norms for a general population of adult women. Because of the particular focus of our interest on creativity and mental health, we have also made comparisons with 16 PF data from two other important studies by Cattell, one describing creative research scientists (Cattell and Drevdahl, 1955) and the other comparing stably and unstably married women (Cattell and Nesselroade, 1967).

METHOD

Subjects

The subjects for this study were 168 women enrolled in a university extension daytime class designed to help women in middle-life find satisfying educational, vocational or volunteer involvements. Sixteen PF data were randomly drawn from the records of three classes given in 1967 and 1968, and represent in number about one-third of the total enrollment to date. The average age of the group was 39.5 years and the average number of years of education was 14.8. About 90% of the class participants were housewives and mothers of partly-grown families.

Instrumentation

The Sixteen Personality Factors Questionnaire was chosen because it has a relatively non-threatening format and score descriptions which are useful in self-assessment. It provides comprehensive measures of independent and objective personality factors which allow comparison

with a large, normal, standardization population and many specialized sub-groups.

The 16 bi-polar scales of the test are listed below:

Factor	Low Score		High Score
A	Reserved	versus	Outgoing, Warmhearted
B	Less Intelligent	versus	More Intelligent
C	Affected by feelings	versus	Emotionally Stable
E	Humble	versus	Assertive
F	Sober	versus	Happy-go-lucky
G	Expedient	versus	Conscientious
H	Shy	versus	Venturesome
I	Tough-minded	versus	Tender-minded
L	Trusting	versus	Suspicious
M	Practical	versus	Imaginative
N	Forthright	versus	Shrewd
O	Placid	versus	Apprehensive
Q_1	Conservative	versus	Experimenting
Q_2	Group-Dependent	versus	Self-Sufficient
Q_3	Casual	versus	Controlled
Q_4	Relaxed	versus	Tense

Scores are indicated in sten units, in which ten equal points just cover the population range. Each point is $\frac{1}{2}$ sigma and the population

mean is 5.5. Factor scores of 3 and below and 8 and above are considered definitely outside the average range. Split-half reliability coefficients for the various factors range from .71 to .93 (Cattell and Eber, 1957).

Procedure

The 16 PF was administered to the women of this study as part of the routine class procedure. Results were pooled to produce a group profile of self-renewing women, which was then compared to the general norms for adult women. Second order factors for anxiety and extroversion, as well as those for creativity and mental health, were computed from the group profile by specification equations (Cattell and Eber, 1957).

In order to relate the evidence on self-renewing women to previous 16 PF research, the group profile was compared to that of eminent researchers in biology, physics and psychology (Cattell and Drevdahl, 1955) and to those of stably and unstably married women (Cattell and Nesselroade, 1967). Profile similarity coefficients (Cattell and Eber, 1957) were computed, as well as the critical mean differences on each factor. The same was done for the creativity and mental health indices.

Finally, a cross-comparison was made of paired creativity and mental health scores for the sample of 168 self-renewing women.

RESULTS

Table 1 gives the mean sten scores and standard deviations on the self-renewing women of the group counseling course. Although the factors

are bi-polar, they are not purely evaluative in the psychological sense; therefore, a score is not necessarily "good" or "bad" when it is reported as positive or negative. Seven of the sixteen factors were found to vary from the general adult women's norms by standard scores that exceed the .0001 level of singificance. They are: B+, more intelligent; C-, more affected by feelings; E+, more assertive; G-, more expedient; M+, more imaginative; Q_1+, more experimenting, and Q_2+, more self-sufficient. In addition, at the .01 level, this group of women is more "tender-minded" or sensitive (I+), and less controlled (Q_3-). At the .05 level, they are more trusting and adaptable (L-). It should be noted that differences of only about $\frac{1}{2}$ sten become significant with group data of this magnitude. It should also be observed that a sten score of 8 falls within the top 16% of the adult population. Other than intelligence, which scores above sten 8, the two most significantly different scores from the general population exceed the mean by one sten. They are Factor Q_1+, experimenting or free thinking, and Factor M+, which describes them as imaginative.

Second order factors, derived by formula from weighted primary factor scores (IPAT#9), place the group mean for self-renewing women at 5.47 for anxiety and 5.88 for extraversion. In relation to a mean of 5.5, there is no real difference in anxiety. It may be said, however, that self-renewing women are more extraverted than the general population.

Table 2 gives a profile comparison of self-renewing women with profiles for the eminent researchers in biology, physics, and psychology

(Cattell and Drevdahl, 1955) and with stably and unstably married women (Cattell and Nesselroade, 1967). Analysis of the profile similairty (r_p), by the method of Cattell and Eber, 1967, shows that correlations range from .71 with researchers, through .76 with stably married women, to .77 with unstably married women. In interpreting these differences, however, it should be kept in mind that most researchers are men. Several factor differences between the creative researchers and self-renewing women correspond with well-documented (Cattell, 1961) sex differences on the 16 PF test, which may account for part of the profile difference between these two groups. It was decided not to correct statistically for this variable.

Statistically significant differences in factor scores, as determined by the computation of critical ratios, are indicated by asterisks in Table 2. Large differences from researchers in factors A, F, I, M, Q_2, and Q_3 are worthy of notice. The discrepancy in the number of significant factor differences between self-renewing women and stably, as compared to unstably, married women is in part a product of the widely divergent sizes of the samples in Cattell and Nesselroade's study.

Table 3 identifies the ten factors which have been systematically related to creativity. Creativity index scores for the general population range from 15 to 150 with a mean of 82.5. Along this continuum, the mean creativity score for self-renewing women is 93.10, more than one standard deviation above the mean. More specifically, 54% of self-re-

newing women have creativity scores at sten 8, 9, or 10, while only 3% of them have creativity scores at the low (sten 1, 2 or 3) end of the continuum. Of the four comparison groups, the researchers achieved the highest creativity index, 105.7, at sten 10. It is assumed that Cattell's research on this highly creative group of men and women contributed largely to the formulation of the specification equation used to determine this score. It is interesting that stably and unstably married women, from a study unrelated to creativity research (Cattell and Nesselroade, 1967), both scored at a relatively high sten 7 on creativity.

Table 4 compares the same four groups on the critical factors related to mental health or "freedom from pathology," (IPAT #9). The mental health index for self-renewing women, computed according to the specification formula, is 22.04. This is almost exactly at the general population mean of 22, within a range from 4 to 40. Researchers and unstably married women scored slightly lower at 21.3 and 19.6, respectively, also within the range of sten 5, while stably married women scored at 17.8, roughly in the range of sten 4. The lower mental health score among stably married women as compared to unstably married women gives rise to speculation. Freedom from pathology, as defined by the mental health index, is not treated in Cattell and Nesselroade's original research.

In an effort to better understand the relationship between creativity and mental health for self-renewing women, some additional evidence on these second-order factor scores is presented in Table 5. No significant

differences from sub-group to sub-group of the self-renewing women sample were discovered within either of the two composite factors, which attests to the consistency of the measures. A paired comparison between creativity and mental health, on the other hand, resulted in negative correlations for all sub-groups ranging from -.03 to -.45. The correlation between creativity and mental health for the total sample under study fell at -.26, which is significant at the .01 level. In other words, the women with the higher creativity scores tend to have the lower mental health scores, and vice versa.

DISCUSSION

The results of this study support the contention that self-renewing women do indeed have several constant and unusual characteristics. As measured by the B factor, they are highly intelligent as compared to the general women's population. They score significantly above either of the two married women's samples, both of which were above average. Surprisingly, they scored above the pooled sample of scientific researchers in biology, physics, and psychology. Factor B is a brief measure of general intelligence. This factor is not highly correlated with the other factors of the 16 PF, which are more strictly descriptive of personality dimensions, but it is equally useful in assessment.

Among other major findings, it may be said that self-renewing women are very creative. The group sten score of 8 for this composite factor

indicates that in answering the test items these women described themselves much as do the creative scientists, artists, and writers of Cattell's original research on creativity (IPAT #10). There are some features of creativity, so described, that might be discussed in more detail.

For instance, a creative person is supposedly a "self-sufficient introvert" (IPAT #10). Introversion is not a pure factor among creative people, according to Cattell in the same publication. Creative researchers, for example, conform to the introversion pattern except for H+ and E+ scores. They are thus, more venturesome or socially bold and more assertive than most introverts. This caused Cattell to conclude that "the creative person is someone who might naturally have been a extrovert, but who has experienced major inhibiting forces." Self-renewing women share venturesomeness and assertiveness with researchers by the direction of their scores. The women have an additional primary factor in the direction of extroversion. This is Factor F+, described as happy-go-lucky enthusiasm. Scientists are markedly sober and serious in comparison. Could it be that self-renewing women are creative persons, naturally extroverted, who have <u>not</u> experienced major inhibiting forces? In any case, we are justified in calling these creative women "self-sufficient extroverts."

According to Drevdahl (1956), artists and writers are less introverted than scientists. This is not the only way in which self-renewing women's scores correspond to those of artists and writers. They share high levels of intelligence (B+) imagination (M+), and experimental

bent (Q_1+). In all, self-renewing women match in direction nine of the twelve scores which describe creative artists according to Drevdahl.

Another question arises: Are these women, who express a need for greater self-actualization, "feminine" as compared to women in general? The 16 PF normative standards for adult women were revised in 1961 to include a better proportion (80%) of married women, (Cattell and Green, 1961). In comparison to this population, self-renewing women are more reserved, more affected by feelings, more tender-minded, more trusting, imaginative, placid, and relaxed--all of which sound feminine. By other factors, however, they may also be labeled experimenting, shrewd, expedient, venturesome and assertive. The latter two, venturesome and assertive, have been found by McClain (1968) to be related to success in women counselors. McClain suggests, however, that there is an optimum level of these traits beyond which a woman seems to lose her feminine quality and, along with it, her effectiveness. Guilford (1962), in discussing factors which aid creativity, has said that the more intelligent men and women are, the more alike they are as measured by masculinity-feminity scales.

Social scientists agree that psychological health is important for creativity. We cannot overlook the negative .26 correlation found within the sample between creativity and mental health. Self-renewing women as a group, however, achieved a mean mental health score just marginally above the average in relation to the general population. It is also

noteworthy that this score was above the average of any of the comparison groups, including that of the very creative eminent researchers. We may conclude therefore, that self-renewing women, as a group, function within a creatively productive range of psychological health.

It would be interesting to speculate on how the role of wife and mother might contribute to the development of the creative aspects of personality. It is certain that these women with an urge toward self-renewal are highly creative and reasonably healthy psychologically at this choice point in their lives. Self-renewal may well be motivated by a fundamental quality of human nature which, at a time of ebbing need for imaginative responses and creative solutions within the home, demands energy transformation in a renewed bid for self fulfillment.

CONCLUSION

One hundred sixty-eight women, most of them mothers of about age 40, were tested on the 16 PF Questionnaire as part of a group counseling class to help them find new life goals. Scores revealed them to be highly intelligent and highly creative as compared to the standard for adult women. Factor direction suggests that self-renewing women as a group might be described as "self-sufficient extroverts." This contrasts with Cattell's findings which caused him to describe creative people as "self-sufficient introverts." Mental health scores were average in relation to the general population and above average in relation to the

other comparison groups of this report, therefore, it was concluded that self-renewing women function within a productive range of psychological health.

Follow-up studies are in progress to determine the extent to which the women of this study have been able to actualize their current need for greater self-fulfillment by enlarging the scope of their lives.

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TABLE 1

16 PF Data on Self-Renewing Women as Compared with General Adult Women's Sten Scores (Mean = 5.5)

N = 168

Factors	M Sten Scores	SD	Sten Differences	p value (two-tailed)
A	5.28	1.72	-.2*	.12
B	8.14	1.31	2.6	<.0001
C	4.81	1.75	-.7	<.0001
E	6.19	1.72	.7	<.0001
F	5.84	2.02	.3	.051
G	4.79	1.88	-.7	<.0001
H	5.74	1.82	.2	.15
I	5.86	1.74	.4	.003
L	5.13	2.31	-.4	.02
M	6.70	2.38	1.2	<.0001
N	5.59	2.12	.1	.52
O	5.33	2.01	-.2	.19
Q_1	7.14	1.81	1.6	<.0001
Q_2	6.08	1.81	.6	<.0001
Q_3	5.05	1.67	-.4	.002
Q_4	5.28	2.09	-.2	.21

* Sign of the difference indicates the direction from the general population mean.

TABLE 2

Profile Comparison of Self-Renewing Women with Eminent Researchers and with Stably and Unstably Married Women

Factors	S-R Women M	Researchers M	St. Married M	Unst. Married M
A	5.28	3.36***	5.87**	6.89***
B	8.14	7.64*	6.34***	5.57***
C	4.81	5.44**	4.52	5.68*
E	6.19	6.62	4.63***	6.22
F	5.84	3.15***	4.50***	5.27
G	4.79	4.10**	4.62	4.51
H	5.74	6.01	4.70***	5.19
I	5.86	7.05***	7.13***	7.32***
L	5.13	5.36	5.65*	4.68
M	6.70	5.36***	6.48	6.73
N	5.59	5.50	4.73***	5.51
O	5.33	4.38***	6.54***	6.27*
Q_1	7.14	7.00	5.57***	6.78
Q_2	6.08	7.52***	6.22	6.11
Q_3	5.05	6.44***	4.82	5.41
Q_4	5.28	4.91	6.69***	7.11***
	N = 168	N = 140	N = 102	N = 37
		ΣD^2 = 20.59	ΣD^2 = 17.65	ΣD^2 = 17.47
		r_p = .71	r_p = .76	r_p = .77

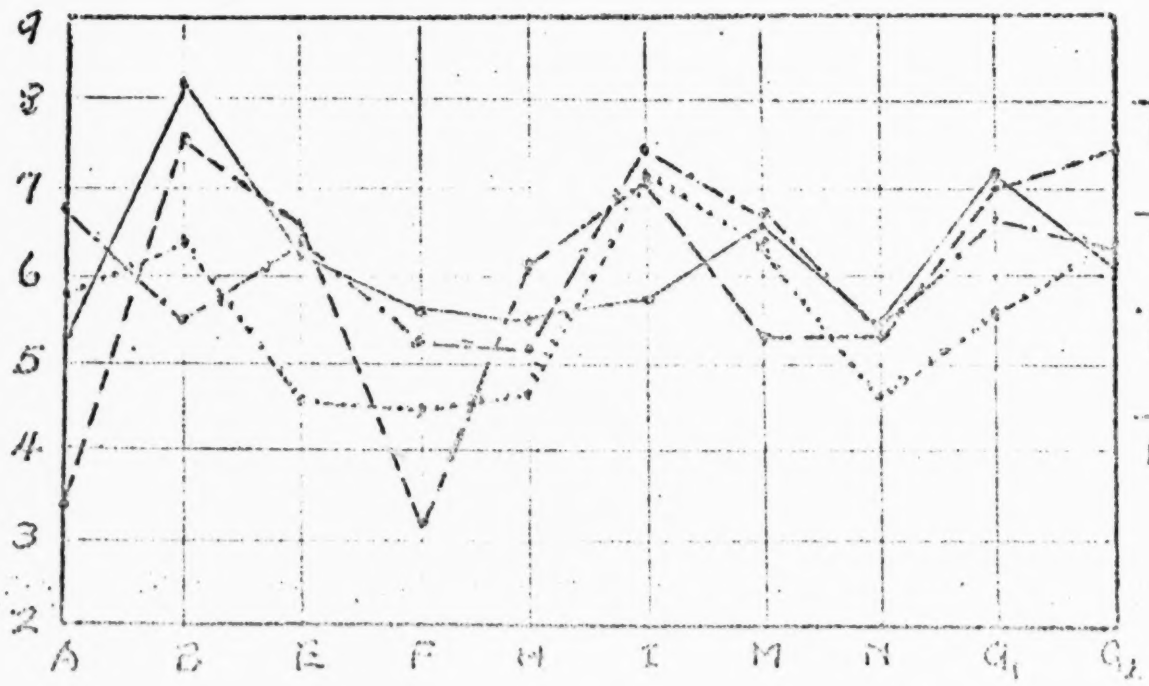
Signif. level, (two-tailed)
*.05
**.01
***.001

D = Factor difference, in stens, from S-R Women
r_p = Profile similarity coefficient

TABLE 3

CREATIVITY PROFILE
Comparison of Self-Renewing Women with Eminent Researchers and with Stably and Unstably Married Women

Factors	S-R Women M	Researchers M	St. Married M	Unst. Married M
A	5.28	3.36***	5.87**	6.89***
B	8.14	7.64*	6.34***	5.57***
E	6.19	6.62	4.63***	6.22
F	5.84	3.15***	4.50***	5.27
H	5.74	6.01	4.70***	5.19
I	5.86	7.05	7.13	7.32
M	6.70	5.36***	6.48	6.73
N	5.59	5.50	4.73***	5.51
Q_1	7.14	7.00	5.57***	6.78
Q_2	6.08	7.52***	6.22	6.11
Creativity Index	93.10	105.70	90.40	88.00
Sten Equiv.	(Sten 8)	(Sten 10)	(Sten 7)	(Sten 7)



Researchers
$\Sigma D^2 = 16.72$
$r_p = .55$

St. Married
$\Sigma D^2 = 13.78$
$r_p = .60$

Unst. Married
$\Sigma D^2 = 12.08$
$r_p = .65$

D and r_p as in Table 2.

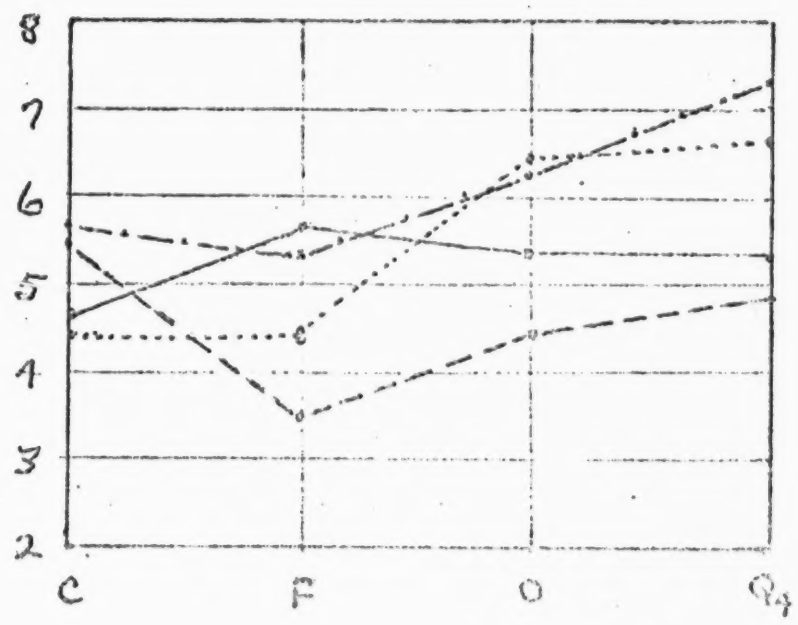
Significant at *.05, **.01, ***.001 level, two-tailed.

TABLE 4

MENTAL HEALTH PROFILE
Comparison of Self-Renewing Women with Eminint Researchers and with Stably and Unstably Married Women

Factors	S-R Women M	Researchers M	St. Married M	Unst. Married M
C	4.81	5.44**	4.52	5.68*
F	5.84	3.15***	4.50***	5.27
O	5.33	4.38***	6.54***	6.27*
Q_4	5.28	4.91	6.69***	7.11***
Mental Health Index Sten Equiv. (Estimated)	22.04 (Sten 6)	21.30 (Sten 5)	17.79 (Sten 4)	19.57 (Sten 5)
	N = 168	N = 140	N = 102	N = 37
		ΣD^2 = 8.65 r_p = .48	ΣD^2 = 5.32 r_p = .65	ΣD^2 = 5.50 r_p = .65

(D and r_p as in Table 2)



Significant at *.05, **.01, ***.001 level, two-tailed.

TABLE 5

Creativity and Mental Health of Four Sub-Groups of Self-Renewing Women

Means, S. D.'s and Intercorrelations Critical Ratios between Groups

Group	N	Creativity				Mental Health				r and p
		M	SD	x/σ	p	M	SD	x/σ	p	
I	37	91.24	11.60			22.46	5.23			-.35 <.05
				1.78	.08			.16	.88	
II	43	95.53	9.57			22.28	5.00			-.45 <.01
				1.87	.06			.41	.68	
III	45	91.80	9.06			21.82	5.48			-.23 ns
				0.95	.34			.12	.90	
IV	43	93.63	9.19			21.67	5.38			-.03 ns
Total	168	93.10	9.89			22.04	5.24			-.26 <.01

Name: Self-Reviewing Woman

Comments: Lui and Mr. Bowen

FACTOR	Raw Score Form A	Raw Score Form B	Raw Score Total	Standard Score	LOW SCORE DESCRIPTION	HIGH SCORE DESCRIPTION
A				5.28	**RESERVED,** DETACHED, CRITICAL, COOL (Sizothymia)	OUTGOING, WARMHEARTED, EASY GOING, PARTICIPATING (Affectothymia, formerly Cyclothymia)
B				8.14	**LESS INTELLIGENT,** CONCRETE-THINKING (Lower scholastic mental capacity)	MORE INTELLIGENT, ABSTRACT THINKING, BRIGHT (Higher scholastic mental capacity)
C				4.81	**AFFECTED BY FEELINGS,** EMOTIONALLY LESS STABLE, EASILY UPSET (Lower ego strength)	EMOTIONALLY STABLE, FACES REALITY, CALM, MATURE (Higher ego strength)
E				6.19	**HUMBLE,** MILD, ACCOMMODATING, CONFORMING (Submissiveness)	ASSERTIVE, INDEPENDENT, AGGRESSIVE, STUBBORN (Dominance)
F				5.84	**SOBER,** PRUDENT, SERIOUS, TACITURN (Desurgency)	HAPPY-GO-LUCKY, IMPULSIVELY LIVELY, GAY, ENTHUSIASTIC (Surgency)
G				4.79	**EXPEDIENT,** EVADES RULES, FEELS FEW OBLIGATIONS (Weaker superego strength)	CONSCIENTIOUS, PERSEVERING, STAID, RULE-BOUND (Stronger superego strength)
H				5.74	**SHY,** RESTRAINED, DIFFIDENT, TIMID (Threctia)	VENTURESOME, SOCIALLY BOLD, UNINHIBITED, SPONTANEOUS (Parmia)
I				5.86	**TOUGH-MINDED,** SELF-RELIANT, REALISTIC, NO-NONSENSE (Harria)	TENDER-MINDED, DEPENDENT, OVER-PROTECTED, SENSITIVE (Premsia)
L				5.13	**TRUSTING,** ADAPTABLE, FREE OF JEALOUSY, EASY TO GET ON WITH (Alaxia)	SUSPICIOUS, SELF-OPINIONATED, HARD TO FOOL (Protension)
M				6.70	**PRACTICAL,** CAREFUL, CONVENTIONAL, REGULATED BY EXTERNAL REALITIES, PROPER (Praxernia)	IMAGINATIVE, WRAPPED UP IN INNER URGENCIES, CARELESS OF PRACTICAL (Autia) MATTERS, BOHEMIAN
N				5.59	**FORTHRIGHT,** NATURAL, ARTLESS, SENTIMENTAL (Artlessness)	SHREWD, CALCULATING, WORLDLY, PENETRATING (Shrewdness)
O				5.53	**PLACID,** SELF-ASSURED, CONFIDENT, SERENE (Untroubled adequacy)	APPREHENSIVE, WORRYING, DEPRESSIVE, TROUBLED (Guilt proneness)
Q_1				7.14	**CONSERVATIVE,** RESPECTING ESTABLISHED IDEAS, TOLERANT OF TRADITIONAL DIFFICULTIES (Conservatism)	EXPERIMENTING, CRITICAL, LIBERAL, ANALYTICAL, FREE-THINKING (Radicalism)
Q_2				6.08	**GROUP-DEPENDENT,** A "JOINER" AND SOUND FOLLOWER (Group adherence)	SELF-SUFFICIENT, PREFERS OWN DECISIONS, RESOURCEFUL (Self-sufficiency)
Q_3				5.05	**UNDISCIPLINED SELF-CONFLICT,** FOLLOWS OWN URGES, CARELESS OF PROTOCOL (Low integration)	CONTROLLED, SOCIALLY-PRECISE, FOLLOWING SELF IMAGE (High self-concept control)
Q_4				5.28	**RELAXED,** TRANQUIL, TORPID, UNFRUSTRATED (Low ergic tension)	TENSE, FRUSTRATED, DRIVEN, OVERWROUGHT (High ergic tension)

STANDARD TEN SCORE (STEN)

→ Average ←

1	2	3	4	5	6	7	8	9	10

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A sten of	1	2	3	4	5	6	7	8	9	10	is obtained
by about	2.3%	4.4%	9.2%	15.0%	19.1%	19.1%	15.0%	9.2%	4.4%	2.3%	of adults